

Abstract of the invention

A ceramic cutting tool configured as multiphase ceramic with an improved resistance to wear of the edge area or edge layer consists of a base ceramic and of a sacrificial phase as well as eventually additives and primary hard material phases and an eventually multilayered edge area or edge layer resistant to wear, hard, not deposited made of at least one hard material phase, whereby the edge area is intimately intergrown with the starting ceramic and which is formed by aging the starting ceramic in a defined atmosphere.

Fig. 1

- 10 - Starting ceramic consisting of
  - base ceramic, for example
  - additives, for example
  - sacrificial phase, for example
  - primary hard material phase, for example
- 20 - Edge area or edge layer, for example

Fig. 3

- A - Powder compound
- B - Powder processing
  - Attritor grinding 7 h, 700 rpm, in acetone, X-TZP grinding balls
- C - Powder conditioning
  - Drying, screening
- D - Green body production
  - Pressing uniaxial
  - cold isostatic
- E - Reaction sintering
  - vacuum, after Argon rinsing
- F - Hard machining
  - grinding
- G - High-temperature isostatic pressing
- H - Cutting plate

Fig. 4

- Powder processing
- A Powder compound
- B Attritor grinding
  - Acetone, grinding balls, container
- C Drying/screening
- D Green body manufacturing

uniaxial pressing  
cold isostatic pressing  
E Reaction sintering  
vacuum  
pores  
F Hard machining  
G High-temperature isostatic pressing argon  
H Cutting plate

Fig. 5

Junction area  
Basic structure

Fig. 6

Scanning electron microscope photos  
Element concentration

Fig. 7

Cutting time  
Width of wear land  
Travel of the cutting tool  
sintered  
reference - high-temperature pressed  
Fractures  
Cutting ceramic according to the invention  
Cutting speed  
Cutting depth  
Forward feed